

## **REMARKS**

Reconsideration of this application, based on this amendment and these following remarks, is respectfully requested.

Claims 1 through 39 remain in this case. Claims 5 and 24 are amended.

Claims 5 and 24 were objected to because of the informality of introducing an acronym into the claims without sufficient descriptive basis; each of these claims is amended to provide such descriptive basis, as urged by the Examiner.

Applicants note the provisional double patenting rejection of the obviousness type relative to then-copending application S.N. 10/454,421. Applicants wish to note that this copending application issued on July 24, 2007<sup>1</sup> as U.S. Patent No. 7,248,849 B1. Without acquiescing in the double patenting rejection, Applicants offer to provide the appropriate terminal disclaimer in this application at such time as this double patenting rejection is the sole basis of rejection.

Claims 1 through 39 were rejected under §103 as unpatentable over the Dent reference<sup>2</sup> in view of the Zangi et al. reference<sup>3</sup>. Regarding both claims 1 and 20, the Examiner asserted that the Dent reference discloses all of the subject matter of the claims except for explicitly teaching input branches receiving branch-specific signals transmitted across communications channels. The Examiner found that the Zangi et al. reference teaches such input branches and the signals received, and found that it would have been obvious to modify the system and method of the Dent reference to have input branches receiving branch-specific signals transmitted across communications channels, in order to minimize interference by using the branch specific prefilters.<sup>4</sup>

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<sup>1</sup> Coincidentally, on the very date that the Office Action was mailed.

<sup>2</sup> U.S. Patent No. 6,996,380 B2, issued February 7, 2006 to Dent.

<sup>3</sup> U.S. Patent Application Publication No. US 2002/0176492 A1, published November 28, 2002, from an application filed May 11, 2001 by Zangi et al.

<sup>4</sup> Office Action of July 24, 2007, pages 4 and 5.

Applicants respectfully traverse the rejection, on the grounds that it is based on a wholesale misinterpretation of the Dent reference, or a wholesale misapplication of its teachings to the claimed invention.

The preamble of claim 1 expressly states that the claimed method is “a method for training branch-specific prefilters in a receiver having at least two input branches” that each receive branch-specific signals. It simply cannot be any more clearly stated that the method of claim 1 is directed to training filters *in a receiver*.

In contrast, virtually all of the cited portions of the Dent reference refer to operations being carried out in connection with a *transmitter*. For example, the Examiner cited column 9, lines 52 through 62 as teaching “prefilters in a receiver having at least two input branches”; that cited portion of the Dent reference in fact reads:

Referring still to FIG. 1, information symbol streams  $S_1$ ,  $S_2$ , and  $S_3$  intended respectively for mobile terminals 16 A, 16 B, and 16 C are input to a central **transmit processor** 18 that serves a plurality of base stations 12 A, 12 B and 12 C. **Transmit processor** 18 includes a numerical processor 20 to perform the matrix operations on the information signals as described above. The **transmit processor** 18 may comprise one or more processors, such as digital signal processors, or may be comprise a portion of another network processing system, such as the MSC 19 mentioned earlier.<sup>5</sup>

This portion of the reference explicitly refers to Figure 1, which clearly teaches transmit processor 18 as being located in the transmit data path. The Examiner also asserts column 11, lines 3 through 10, of the Dent reference as teaching “prefilters in a receiver having at least two input branches”:

The information bearing signals  $S_j$  (e.g., symbol streams  $S_1$ ,  $S_2$ , and  $S_3$ ) carrying desired information for mobile terminals 16 A, 16 B, and 16 C, respectively are input to **numerical processor** 20. Within the **numerical processor** 20, signals  $S_j$  are processed through IIR filters 30 of order  $(N-1)L$  corresponding to the reduced denominator polynomial and through FIR filters 34 of order  $(N-1)L$  corresponding to the adjoint matrix polynomials as follows.<sup>6</sup>

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<sup>5</sup> Dent, *supra*, column 9, lines 52 through 62 (emphasis added).

<sup>6</sup> Dent, *supra*, column 11, lines 3 through 10 (emphasis added).

Figure 1 clearly shows numerical processor 20 as part of *transmit processor* 18, and thus, as discussed above, in the transmit data path of the network.

The Examiner does not stop here, in asserting transmit functionality in the reference as meeting the method steps directed to training filters in a receiver. Rather, the Examiner asserts that the determining step of claim 1, which recites determining a conditioned channel frequency response without reference to branch-specific prefilters, is taught by numerous locations of the Dent reference.<sup>7</sup> Again, each and every one of these cited locations of the Dent reference is directed to operations involved in transmission, and not in receipt. Indeed, many of these cited locations<sup>8</sup> relate to the “waterfilling” algorithm, by way of which the power transmit spectrum is shaped among the available frequency components.<sup>9</sup> Similarly, virtually all of the cited portions of the Dent reference<sup>10</sup> applied by the Examiner as teaching the computing step are also directed to transmit functions in the disclosed network.

A portion of the Dent reference is directed to the receive data path of its network<sup>11</sup> and was applied against the computing step. However, as evident from the reference itself, these cited portions deal with “the basic operation of [a] RAKE receiver 110”<sup>12</sup>; there is no disclosure in those portions of the Dent reference regarding the computing of frequency responses in branch-specific prefilters from a frequency response of the conditioned channel that was determined without reference to the branch-specific prefilters, as required by claim 1.

Accordingly, it is readily apparent that the cited teachings of the Dent reference are primarily directed to operations involved in the transmission of signals over communications channels, and not to operations related to training prefilters in a receiver. The Dent teachings, as

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<sup>7</sup> Office Action, *supra*, page 4, *citing* Dent, *supra*, at column 18, lines 17 through 22; column 4, lines 11 through 21; column 14, lines 4 through 17 and lines 37 through 56; column 15, lines 41 through 56; and column 17, lines 5 through 17.

<sup>8</sup> Specifically Dent, *supra*, at column 14, lines 4 through 17 and lines 37 through 56; column 15, lines 41 through 56; and column 17, lines 5 through 17.

<sup>9</sup> Dent, *supra*, column 13, line 56 through column 14, line 3 (“An optimum solution for a single transmit antenna 14 transmitting to a single mobile terminal 16 is called the ‘waterfilling’ solution.”).

<sup>10</sup> *I.e.*, Dent, *supra*, column 16, lines 13 through 57; column 3, lines 11 through 32; column 27, lines 15 through 18; “Parts 30A, 30B, 30N of Figure 2”; column 27, lines 35 through 41, column 28, lines 9 through 16, column 29, lines 23 through 29.

<sup>11</sup> Dent, *supra*, column 32, lines 10 through 36.

<sup>12</sup> Dent, *supra*, column 31, lines 34 and 35.

applied by the Examiner and in fact, are simply not applicable to the receiver prefilter training method of claim 1 in this application. And at the risk of providing hindsight ammunition, the Examiner did not even attempt to assert that the teachings of the Dent reference directed to the transmit data path would be obviously also applied to the claimed method of training receiver prefilters. The Examiner merely treated the Dent teachings as though they were directed to a receiver, and ignored the inconvenient truth that these teachings are related to the transmit data path.

Accordingly, the rejection of claim 1 and its dependent claims is based on a gross misinterpretation or mischaracterization of the Dent reference, and is therefore in serious error. Withdrawal of the §103 rejection of claim 1 and its dependent claims is respectfully requested.

Furthermore, the Zangi et al. reference fails to provide the teachings missing from the Dent reference, and that are required by claim 1. The Examiner nowhere asserted that the Zangi et al. reference discloses or suggests the determining and computing steps of claim 1; rather, the Zangi et al. reference was asserted only as teaching a receiver having at least two input branches that receive branch-specific signals transmitted across communications channels. And, in fact, the Zangi et al. reference does not teach the determining and computing steps of claim 1, nor any detail whatsoever regarding the derivation of any prefilters in its disclosed system.<sup>13</sup>

Accordingly, Applicants submit that the §103 rejection of claim 1 and its dependent claims is in error, and that in fact these claims are patentably distinct over the applied references.

The inapplicability of the cited teachings of the Dent reference is even more apparent in connection with claim 20 and its dependent claims. Claim 20 is expressly directed to a receiver that includes a training module, and prefilter modules. However, as discussed above in detail, those portions of the Dent reference that are cited against the claims in fact describe the transmit data path of the disclosed system.

As discussed above, the portion of the Dent reference at its column 9, lines 52 through 62, cited as teaching “prefilters in a receiver having at least two input branches” instead refers to a “transmit processor 18” that is clearly disclosed by the reference as being located in the

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<sup>13</sup> Zangi et al., *supra*, paragraph [0045].

transmit data path. The passage at column 11, lines 3 through 10, of the Dent reference, cited as teaching “prefilters in a receiver having at least two input branches”, instead is directed to a numerical processor 20 that is clearly disclosed by the reference as part of its transmit processor 18, and thus, as discussed above, in the transmit data path of the network. The locations of the Dent reference that were asserted as teaching the determining of a frequency response of a conditioned channel without reference to branch-specific prefilters, generally refer to the “waterfilling” algorithm by way of which the power transmit spectrum is shaped among the available frequency components. And virtually all of the cited portions of the Dent reference applied by the Examiner as teaching the computing of frequency responses are also directed to transmit functions in the disclosed network, or while discussing a receiver function, nowhere mention the computing of frequency responses in branch-specific prefilters from a frequency response of the conditioned channel that was determined without reference to the branch-specific prefilters, as claimed.

Indeed, the rejection of claim 20 presented in the Office Action does not even assert any particular elements of the Dent or Zangi et al. references as corresponding to the training module or the prefilter modules of the apparatus of claim 20. The entirety of the stated basis for the rejection refers to the method steps of claim 1.<sup>14</sup>

Applicants therefore also respectfully submit that the rejection of claim 20 and its dependent claims is based on the same gross misinterpretation or mischaracterization of the Dent reference as discussed above relative to claim 1, and is therefore in serious error. Withdrawal of the §103 rejection of claim 20 and its dependent claims is also respectfully requested.

Nor does the Zangi et al. reference make up the shortfall of the teachings of the Dent reference relative to claim 1. The Examiner did not assert that the Zangi et al. reference discloses or suggests the determining and computing functions performed by the modules of claim 20; for similar reasons as discussed above relative to claim 1, the Zangi et al. reference in fact does not disclose or suggest these functions, as discussed above relative to claim 1.

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<sup>14</sup> Office Action, *supra*, page 4.

Applicants therefore submit that the combined teachings of the applied references fall short of the requirements of claim 20 and its dependent claims.

Accordingly, Applicants submit that the §103 rejection of claim 20 and its dependent claims is in error, and that these claims are in fact patentably distinct over the applied references.

And for these reasons, Applicants traverse the §103 rejection of all of the claims 1 through 39 in this case.

Applicants respectfully submit that all claims now in this case are in condition for allowance. Reconsideration of this application is therefore respectfully requested.

Respectfully submitted,

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